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ABSTRACT

"Task Analysis" is a required course in the Communication, Education, and Training Department at the University of Wisconsin-Stout. A research study was designed to assess the effectiveness of a World Wide Web-based instruction program in the delivery of task analysis content. The program was presented and delivered on the Internet during a period of eight weeks in the summer of 1997. All students in the class were asked to complete the evaluation form; a total of 22 evaluations were returned. Respondents rated several statements using a 5-point Likert scale. In response to the question of whether they would prefer to take the course a second time in the classroom or on the Internet, 77% indicated they would prefer the classroom. In addition to the data gathered through this study, graduate students enrolled in the course performed an analysis of the Web delivery system that addressed strengths and weaknesses of the course and resulted in several recommendations. Findings indicated that this method is a viable way to deliver teacher education instruction to students at remote locations. The potential for Internet delivery of courses should continue to grow as more people have Internet connections and become more proficient in the use of the Internet. (AEF)

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TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

The Development and Evaluation of the Internet Delivery of the Course "Task Analysis"

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The course, Task Analysis, is one of the required courses in the Bachelor of Science degree in Vocational Education, the specialization in Training and Human Resource Development, as well as the Master of Science degree in Training and Development at the University of Wisconsin-Stout. The course is offered by the Communication, Education, and Training Department.

Normally, the course is delivered by the instructor to students in the form of lectures in a traditional classroom. In the summer of 1997, the method of delivery was changed from traditional learning to asynchronous learning, using the Internet. This was a means of delivering the course content to meet the needs of a cohort of students who were teachers at the Milwaukee Area Technical College, and enrolled in the Vocational Education undergraduate degree at the University of Wisconsin-Stout. Milwaukee is approximately 265 miles from the UW-Stout campus. Many of the courses for the program had been delivered to the students face-to-face on weekends in Milwaukee, but it was felt that they needed more flexibility to complete the program. The Internet is considered the fastest growing educational phenomenon in the history of the world (Dryli & Kinnaman, 1995). It allows students to learn anywhere, at anytime, as well as to access content at their own pace. Therefore, a WWW-based instruction program on the subject of Task Analysis was developed using the authoring software, *ToolBook II Instructor*, in order to deliver the content to students enrolled in the Task Analysis course in the summer 1997. In addition to content delivered via the WWW, additional resources were placed on a *Lotus Notes Domino* server. The course was offered in two separate sections. The first section consisted of UW-Stout undergraduate students who were in the Vocational Education Program and were employed as teachers at the Milwaukee Area Technical College. Students who were pursuing undergraduate and graduate degrees at the University of Wisconsin-Stout were included in the second section.

Literature Review

The literature review for this study (Bhuripanyo, 1997) started out by looking at computer-based training The section reviewed tracking students responses (Campbell, 1993), students controlling of sequencing (Kearsly, 1983), and the differences between classroom instruction and computer-based learning (Steinberg, 1991).

The next section of the literature review dealt with authoring systems. Yeager (1993) addressed the four areas that an authoring system should handle; presenting information, judging answers, branching, and managing instruction. Hefner (1996) discussed the features of an authoring system and reviewed Authorware, IconAuthor, CBT Express and ToolBook Instructor II. The rest of this section discussed ToolBook Instructor II (Hall, 1997) as it provided a solution to convert authored content to HTML so that it could be accessed over the WWW.

The last section of the literature review examined the use of the WWW in education. Relan and Gillani (1997) addressed different methods in designing instructional strategies using the WWW. Driscoll (1997) provided an in-depth discussion of web-based training and compared web computer-based training, web-based employee performance support, asynchronous virtual classroom, and synchronous virtual classroom. Hall (1997) compared the advantages and disadvantages of web based instruction.

The review of 1996 and 1997 studies by Chamlongsupalak laid the foundation for the research design.

Methodology

The research study was designed to assess the effectiveness of a Web-based instruction program in the delivery of task analysis content. The program was partially developed by using *Asymetrix ToolBook II Instructor* software. In evaluating the program, all students enrolled in the Task Analysis class were asked to complete the evaluation forms. The form was used as a research instrument to evaluate the effectiveness of the Web-based instruction program.

The program was presented and delivered on the Internet during a period of eight weeks in the summer of 1997. To inform participants about this research study, the

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researcher sent out cover letters along with the evaluation forms on July 15, 1997. Each participant was asked to fill out the evaluation form and return it in the provided envelope by the 30th of July 1997. A total 13 evaluation forms were sent back to the researcher. In order to increase the response rate, follow-up letters and evaluation forms were mailed out to the participants who did not complete the forms in the first mailing timeline. The second timeline allowed participants until the 10th of August 1997 to respond. Nine evaluation forms were completed and returned to the researcher. There were 22 (57.89%) returned evaluation forms from both mailings.

Findings

The respondents were asked to rate each of the following statements a 5 point Likert scale with a point range the included: 5 (strongly agree), 4 (agree), 3(no opinion), 2(disagree), and 1(strongly disagree). The mean scores for each statement follow.

Table 1.

Statement	Mean Score
Objectives of the program were clearly stated.	3.68
Content organized in appropriate sequence.	4.00
Content was relevant.	3.86
Content was understandable.	3.23
Content was knowledgeable.	3.55
Content was clear.	2.91
Content was accurate.	3.64
Content covers all essential information (both theory and practice).	3.36
Content was useful for the practical session.	3.05
Content was free of spelling and grammatical errors.	4.00
Content contained effective illustrations.	3.64
Attractive title screen /design.	4.05
Legible and attractive text.	4.00
Detailed and step-by-step instruction.	3.09
Understandable and logical command.	2.95
Attractive colors/design.	3.91
Effective use of graphics/colors.	3.95
Effective function key.	2.90
Helpful main menu screen/user's guide.	3.14
Effective navigator.	2.82
Easily controlled the sequence of the program.	2.95
Met student's needs.	3.09
Met students expectations.	2.86
Appropriate instructional format of the course	2.95

There were no statements that received a below average rating.

When the respondents were asked, If you could take this course again, would you prefer to take it: (A) In the classroom (B) Via the Internet. Seventy-seven percent responded that they would prefer in the classroom and twenty-two percent responded via the Internet.

In addition to the data gathered through this study, graduate students enrolled in the course performed an analysis of the WWW delivery system. A summary of their discussion follows categorized under the headings: strengths of the course, weaknesses of the course, and recommendations.

Strengths of the Delivery from Students

- The delivery provided convenience to the learners both in terms of freedom of time and freedom of space.
- It promoted individual learning yet allowed for group learning activities.
- It allowed learners to process course material at their own speed.
- Opportunity to read classmates' opinions through postings to the Lotus Notes Learning Space CourseRoom. Each posting brought new insight because of the diversity of the students.
- The clarity of the on-line content provided exactly what you needed to know. In classroom experiences the professor often provides more information than what is needed and the student is left wondering what is important and what isn't.
- Using the telephone to discuss projects with the instructor allowed for a sense of connection.

Weaknesses of the Delivery from Students

- Required the learner to be self-disciplined
- The delivery was not appropriate for all learning styles.
- Despite on-line discussion groups and contact from the instructor some students who did not work in pairs or groups felt isolated and the delivery has the potential to be impersonal.
- Although the WWW content portion of the course that was evaluated in the study was considered relatively easy to use, the Lotus Notes Learning Space section was considered to be confusing to some users.

Student Recommendations

- Make sure that all participants understand the nature of the course and it's limitations.
- Participants should be encouraged or required to work in small groups.
- Improvements in the Learning Space application suite.
- More in-depth orientation to the course and the software.
- Provide a print version of instruction to software use.
- Set up a chat room so students can dialog in real time
- Have students find an Internet site relating to the course and report back to the class on it.
- At the end of the course have a face-to-face meeting of the students.
- Have a mid-term meeting or teleconference.

Summary and Recommendations

Based on this study and other evaluations of the course, it was found that this is a viable way to deliver teacher education instruction to students at remote locations. However, there are some concerns in making Internet delivery a viable alternative to classroom delivery. To better understand the study, it is important to look at the students who took the course and served as participants in the study.

The vast majority of the students in this course were employed as full time teachers in the Wisconsin Technical College System (WTCS) and had associate degrees in a technical area and were completing an undergraduate degree to meet WTCS teaching certification requirements. They were not given other alternatives in taking this course. They were asked some questions regarding the assumptions of this study before it was decided to offer the course in this format. All the students indicated that they had sufficient knowledge and skills related to the use of computers and that they had experience using the Internet. This did not prove to be the case. There were some miscommunications on the availability of adequate computers for them to use at their site and misunderstandings about the level of support available. These issues caused the students some problems as they were getting started. Based on these considerations, the findings of the study, and other input, the following conclusions can be drawn and recommendations made regarding the Internet delivery of the course Task Analysis.

Internet delivery of this course and others shows much potential. It is important that students know the nature of the course before enrolling. For some students, it would be possible to enroll and start at any place and anytime if they have adequate computer skills, can work in isolation, deal with ambiguous situations, and are self-motivated. Students were provided with a checklist, relating to these issues for self-evaluation before beginning the course. Even though students responded positively to this list, many expressed a desire for more support as they proceeded through the course. There is a balancing act in trying to provide as much support to the students as possible and yet allowing them freedom of completing the course at their own pace. It appears that a face-to-face orientation session is important to most learners. There was a three-hour orientation session provided to all students enrolled in the Milwaukee cohort, although one hour of this time was spent in registration and other procedural items. There was also an optional orientation session available to students enrolled through the on campus section.

The first recommendation would be that the course be offered 4 times a year with a one day orientation session. This orientation would be offered at different sites throughout the State of Wisconsin on a rotating basis. The first half of the orientation would familiarize the students with the delivery and the content of the course. During this session the students would be allowed to split into project teams if they wanted to work together. If they chose to work alone, they would be paired up with a "buddy" so they would have someone to contact in addition to the instructor if they had concerns as they progressed through the course. The second part of the orientation would deal with the computer and Internet skills. The students would be provided with hands-on training in using he existing on-line instructional packages. This would insure that they could log on and maneuver through the program. They would also be provided with some background on the Internet and the World Wide Web as some frustrations were caused by not understanding how Internet browsers function and are configured. This computer training also allows for the introduction of more advanced WWW features that allow for better connectivity and submission of projects. A printed guide to the software should be developed as those students who had the most problems with the software were the least comfortable using on-line help. In addition to being partnered with someone in the class for support, each student should have a technical mentor to help them with technology-related problems and a content mentor to provide them with subject-matter related support.

There is a need to include more information in the content section. This would make the course less dependent on print resources. The interface should be evaluated to see if it is as effective as it could be. Although, all complaints on interface design centered on *the Lotus Notes Learning Space* portion of the course, there may be ways to better integrate the content section of the course with the *CourseRoom* and the quizzes. It should be noted that this course was offered shortly after *Lotus Notes* became WWW enabled and there should be improvements as new versions are released. It would also be possible to use the *Notes* client software but that was avoided to make the course easily available at more locations.

The idea of mid-term teleconference and end of the course videoconference should be explored. One disadvantage to this is that it would take away some of the flexibility that was offered to the students, as they would all have to complete the course at the same time.

The course should also be marketed to potential students who are more computer proficient. This market would not require the orientation and would allow for more experimentation with a more open-entry open-exit delivery system.

The potential for the Internet delivery of courses should continue to grow as more people have Internet connections and become more proficient in the use of the Internet. It should provide an excellent avenue to provide courses to educators in the field, but probably has less potential for those aspiring to become teachers.

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